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GENERAL ITEMS

THE WHY OF CIVIL SERVICE

So many questions have arisen with regard to seasonal field appointments during the present year that it seems in order to present briefly the situation now existing, the conditions leading up to it, and the prospects for the future.

The present situation can not very well be explained without a brief glance at the past. Until the last two or three years the Bureau enjoyed a very wide freedom in its selection of employees for seasonal work. Under the general head of "Field Assistant" it was possible to employ men for periods ranging from one to eight or nine months and assign them to jobs ranging all the way from practically unskilled labor to tasks requiring a very high degree of specialized knowledge and technical training. This was, of course, an ideal situation from the standpoint of the Bureau, and particularly to its representative in the field. He was able to select men whom he was satisfied could carry on the work most efficiently and, with the minimum of red tape, secure their appointment and retain their services throughout his active season.

From the standpoint of the Civil Service Commission, however, the situation was not so satisfactory. The function of the Civil Service Commission is to secure properly qualified candidates for positions in all branches of the Government service and to see that these candidates are placed in suitable jobs after they have definitely established their fitness through appropriate examinations. Our practice of appointing field assistants was, of course, not in line with the regular Civil Service policy, since it asked the Commission to tacitly admit by approving appointments that the men recommended were the best qualified candidates available when, as a matter of fact, the Commission had no means of establishing this fact other than by simply accepting the statement of a man whose knowledge of the whole available field was necessarily limited. As a result of this we found during the two past seasons increasing difficulty in securing the Commission's approval of appointments for field assistants. In many cases it was necessary to submit recommendations repeatedly before favorable action could be secured and in some cases approval was definitely withheld and the Bureau was required

to select eligibles from registers for junior entomologist, scientific aid, and other designations. This procedure naturally did not work to the advantage of the Bureau, because in a number of cases the best eligibles had already been appointed and those certified to us were more or less the ones remaining on the register after the cream had been skimmed.

Some months before the opening of the 1932 season it was decided that a system should be adopted which would meet the Civil Service viewpoint and at the same time give the Bureau a chance to secure men whom it had had in previous seasons. After several conferences between representatives of the Department and the Civil Service Commission, the plan of holding a nonassembled examination for the positions of field assistant, field aid, and assistant field aid was worked out. In setting up requirements and grading the papers the Commission has been most considerate of the Department's needs, and requirements were established almost entirely along the lines of our wishes. In grading papers the Civil Service examiners gave the greatest weight to previous experience in the Bureau.

Registers were set up in a number of options and for the past few weeks the Bureau has been securing certifications. The administrative office of the Bureau is very well satisfied indeed with the results of the examination and certifications. Despite the fact that almost a thousand people took the Civil Service examination, the Bureau has, in at least 75 per cent of the cases, been able to secure the certification of the very individuals it desired. To expect a better record of cooperation than this on the part of the Civil Service Commission would be unreasonable. There have, of course, been individual cases in which it has been impossible to secure a man employed in previous seasons, and in these cases the heads of the field stations have often shown a tendency to criticize rather severely the action of the Commission in certifying some one else. In order to establish the justice of such a criticism, it is necessary for the objector to prove that the man whom he desired to appoint is the only available man in the United States qualified to perform the duties of the position. Such a statement frankly does not seem reasonable. When it is considered that the maximum range of the field assistant examination--the highest of the three--is only \$2,500 per annum, it can readily be seen that the requirements for such positions are very unlikely to be so exacting as to limit the field to one man. If in cases where the desired person can not be secured the appointing officer concerned will make an honest and unprejudiced examination of the eligibles on the register and select the one who seems best qualified, the writer believes that in nine cases out of ten the appointee will perform the duties of the position very satisfactorily. Certainly he is deserving of a trial.

A consideration which objectors to the present arrangement seem to overlook is that by putting up with some inconveniences this year the way is paved for reappointing in subsequent years all employees

whose records this year justify such action. Those certified by the Commission are certified on a probationary basis and, therefore, are, if employed, eligible for reinstatement in subsequent years or for furlough at the end of this year's work and restoration to the rolls next season. This is certainly an advantage worth taking into account, since it eliminates entirely the difficulties which we had last year and the year before in securing Civil Service approval of individual appointments.

This discussion may well lead into a general consideration of the whole Civil Service question. There are those to whom any restriction of personal choice seems a very heavy burden. To such persons the whole Civil Service principle is repugnant. They think that the man in immediate touch with the work knows more about it than any one else and that he should be free to select his own assistants unhampered by any limitation imposed by an outside agency. This view, while plausible, is not necessarily sound. The individual making the selection certainly is not in position from his knowledge of the whole available field of material to say that the man whom he may wish to appoint is better qualified than anyone else who could possibly be secured. The Civil Service Commission has had at its disposal candidates selected from a very much wider field. The Commission would be the last to contend that its examiners never make mistakes; but, on the whole, candidates are rated with a very high degree of accuracy and the Commission never refuses to entertain objections to an eligible whom they have certified when such objections have a sound basis and are not based simply on preference.

Before condemning the Civil Service system its opponents within the service should consider its relationship to them personally. This angle has, doubtless, been considered by employees of long experience, but it may not have suggested itself to newer appointees. It is a sound maxim that one should not accept the benefits of any system and at the same time be unwilling to assume such burdens as it may place upon him. Admitting that the Civil Service system does in some cases work inconveniences and even hardships, how many of us would be willing to go back to the system of employment which existed in the Federal Government prior to the adoption of the Civil Service principle? It is one thing to demand the privilege of hiring and firing our assistants; it is quite another to place ourselves in a position of being hired and fired at the whim of some one above us. Prior to the passage of the Civil Service law every change in political administration was attended by a turnover almost beyond the comprehension of those of us who have become accustomed to Government personnel policies under Civil Service. Under the old arrangement no matter how long a man might have been in service or how well he might have performed the duties of his position he was subject to removal in order to make a position for some deserving worker within the party fold of an incoming administration. Under any condition, and especially in troubled economic times like those

through which we are now passing, the security afforded Government employees by the Civil Service system is one not lightly to be cast aside because this same Civil Service system occasionally places a limit on our activities.

In short, the Civil Service system is not perfect in concept or free from error in operation. It does, however, make an honest effort to work the greatest good to the greatest number. It affords candidates a chance to prove their qualifications and to be placed in Federal positions for which they are fitted. It affords Government appointing officers the widest possible field of candidates from whom to make their choices. It gives them every reasonable opportunity to file objections to eligibles who may not be fitted for a particular assignment and provides a six-month period after appointment during which an appointee is on trial, subject to removal without the preferring of charges or other formalities, if his services prove unsatisfactory. Thus it insures justice to both employer and employee and closes the door to no one, as the examinations are open to all citizens of the United States who can meet the requirements. On the whole it seems that the Civil Service Commission is entitled to be considered as a friend not only to the Executive Departments but also to the individual workers.

F. H. Spencer,
Business Manager.

JOSEPH THOMAS BYRNE

The Division of Cereal and Forage Insects sustained a serious loss in the death of Joseph T. Byrne on May 14, last. Mr. Byrne had been in charge of the fiscal affairs of the division since April, 1916, but had been in the employ of the Government for 31 years, including 4 years as secretary to various senators. Capable and painstaking, kindly and considerate, Mr. Byrne had many sterling qualities of mind and heart. His life was replete with charitable works and his outstanding attribute was that of a Christian gentleman. He will be greatly missed by his associates and a large circle of friends.

FOREST INSECTS

Bark beetle control projects completed.—J. M. Miller, Berkeley, Calif., reports: "Control work on the projects on the Sierra and Stanislaus Forests * * * was practically complete by April 30. Following the heavy snows on these areas during January and February, warmer weather prevailed during March and the greater part of April. Brood development was accelerated by these warm temperatures, so that seasonal development was advanced to normal by April 20 and a few beetles of the overwintering broods were emerging. However, low tempera-

tures prevailed during the last week in April, and the control camps again closed for a few days by snow conditions. This cold spell was of great benefit to the projects, as it not only held back the emergence of the insects so that control work could be completed within the period planned for, but also relieved the fire hazard of burning the infested bark."

Susceptibility of ponderosa pine to beetle attack.--Studies by F. P. Keen and W. J. Buckhorn, Portland, Oreg., are reported as follows: "The physical characteristics of ponderosa pine most frequently selected for attack by the western pine beetle (Dendroctonus brevicomis Lec.) have been studied on the intensively cruised plots in southern Oregon during the past four years. Records taken on more than 27,000 beetle-killed trees as to age and degree of vigor as expressed by sixteen crown and age classes, as compared with a similar sample of green unattacked trees, shows certain tree classes (defined by combinations of easily observed factors influencing vigor, the major factors being age, degree of dominance, and crown development) to be decidedly more susceptible to attack than other classes. The vigor of the tree as represented by the length and density of the crown apparently is more important than the age of the tree, although old trees are somewhat more susceptible than younger ones. The study also shows that within the tree classes recognized by Dunning, and generally adopted in Forest Service marking practice, there may be a wide variation in susceptibility to beetle attack. This is particularly true in the overmature trees of Class 5."

Parasites of the larch case bearer.--D. L. Parker, of the gipsy moth laboratory, Melrose Highlands, Mass., reporting on Coleophora laricella Hbn., says: "Two shipments of parasite material were received during the month, both from the same point at Karnten, Austria, totalling 16 boxes of material containing approximately 60,000 hibernation cases. Some of the cases were placed in a cabinet having a temperature of 75° and a relative humidity of 75 to 80 per cent and from these adults of a chalcid were obtained, possibly Entedon sp., which were sent to Washington for identification. Normal issuance started April 21 and at the present time 237 males and 205 females have been obtained." C. W. Collins says, "P. A. Berry has assisted Mr. Parker in caring for the material received from Europe and P. B. Dowden has made dissections in an attempt to determine whether the chalcid parasite is acting as a primary or a secondary. These dissections, he states, seem to show that it is acting as a primary."

Parasites of Phyllotoma nemorata Fall.--Reporting on the birch leaf-mining sawfly, J. V. Schaffner, jr., of the gipsy moth laboratory, says: "The compilations of our rearings from 1915 to 1929, inclusive, show that four of the introduced parasites have been reared from native field-collected larvae." Of these four parasites, Compsilura concinnata Meig. was recovered from 108 identified and 6 unidentified hosts; Sturmia scutellata R. D. from 4 identified and 2 unidentified hosts; Apanteles

melanoscelus Ratz. from 1 identified host; and Meteorus versicolor Wesm. from 2 identified hosts. Mr. Schaffner states further that "Compsilura has also been recovered from a few microlepidoptera and several species belonging under the superfamily Tenthredinoidea."

Dosage of spray determined for gipsy moth.---"During the last few years," reports C. E. Hocd, Melrose Highlands, "woodland plots, usually infested with the gipsy moth, have been sprayed at the rate of 2, 3, 4, and 5 pounds of lead arsenate to 100 gallons of water, both with and without fish oil as an adhesive. In a number of these plots, mats were placed and the number of dead larvae on them counted and recorded, also the degree of defoliation and control noted. Graphs have been made from the results secured and it has been found that 4 pounds of lead arsenate to 100 gallons of water gave as good results as 5 pounds of lead arsenate to 100 gallons of water. In the plots where the larvae were in the first and second stages at the time of spraying, 3 pounds of lead arsenate to 100 gallons of water gave very good results, 90 to 95 per cent of the larvae being dead in 6 to 7 days. In the later stages 4 pounds of lead arsenate to 100 gallons of water seemed sufficient to give good control."

CEREAL AND FORAGE INSECTS

Migration of corn borer larvae heavy.---L. H. Patch, of the European corn borer sublaboratory, Sandusky, Ohio, reports: "Upon becoming full-fed, numbers of corn borers migrate from their host plants, beginning about August 15. In 1927 16.8 per cent of the borer population in a sweet corn field were missing on October 20, as compared to the population on August 20. As a mean of the four years, 1925 to 1928, there were 15.6 per cent fewer borers present in a large number of fields on September 25, as compared to numbers on August 31. In 1931, 17.3 per cent fewer borers were present in the stalks of 24 strains of dent corn on September 28 than on August 20. But there was a wide range in the extent of migration from the individual strains. From 5 of the strains from 0 to 10 per cent of the original borer population migrated; from 11 strains, from 11 to 20 per cent; from 7 strains, from 21 to 30 per cent; and from 1 strain, 40 per cent of the borers migrated between August 20 and September 28. Moreover, the larger part of the migration occurred in the period between August 20 and September 3 where the corn was planted early. The mean planting date of one-half of the plants of the 24 strains was May 8, and of the other half, May 22. A greater percentage of the borers migrate from the most heavily infested strains than from the least infested. From 12 strains averaging 6.6 borers per plant 14.6 per cent of the borers migrated between August 20 and September 28, whereas from 12 strains averaging 10.3 borers per plant 20.4 per cent of the borers migrated."

Field conditions in northwestern Ohio favor corn borer increase.---"The most striking feature in this region," according to K. W. Babcock,

Toledo, Ohio, "is the preponderance of fields disked as the major treatment. Fields of standing stalks still comprise a large portion of the remaining unworked fields. Large quantities of debris have been left on the surface of the fields and in general plowing continues to be of poor quality. Weather conditions have been favorable to the borer and judging from examinations in various types of overwintering quarters the larvae are in good condition. There has been no advance in mortality over the last period."

Larval mortality of corn borer at Toledo.--Morris Schlosberg reports that "A survey made toward the end of April revealed approximately 5 per cent of the larvae to be dead in the stalks and debris of cornfields in the neighborhood of the Toledo, Ohio, Farm. The live larvae appeared heavy and in excellent condition. Low temperatures prevailed but ample moisture was present in the stalks."

Trap lights capture numerous flea hoppers.-- Some interesting records have been obtained by W. W. Stanley at Knoxville, Tenn. (reported by F. W. Poos, Rosslyn, Va.) in trap-light collecting of flea hoppers studied in relation to the alfalfa yellows. These records are summarized as follows:

Total specimens (internal male genitalia) examined.....	1,938
<u>Empoasca fabae</u> (Harris).....	1,309, or 67 per cent
" <u>erigeron</u> DeLong.....	246, or 12 per cent
" sp. (undescribed).....	143, or 7.3 per cent
" <u>solana</u> DeL.....	120, or 6.2 per cent
" <u>bifurcata</u> DeL.....	62, or 3.2 per cent
" <u>alboneura</u> Gillette.....	22, or 1 per cent
" <u>recurvata</u> DeL.....	8 or 0.4 of 1 per cent
" <u>aureoviridis</u> Uhler.....	6
" <u>birdii</u> Goding.....	5
" <u>radiata</u> Gillette.....	5
Other <u>Empoasca</u> (new or species not recognized)	12

All males collected prior to June 1 and after September 14 were examined. These specimens showed a greater proportion of species other than fabae than was found during the period June 1 to September 14. Empoasca fabae was most abundant at the light from June 10 to July 1. It seems logical to conclude that this is true in the field also since the many field collections which have been examined (internal genitalia) bear this out. The proportion of sexes, however, is almost entirely reversed at the light trap, as compared with field collections. Of the total of 2,619 Empoasca examined from these trap-light collections, 74 per cent were males, whereas our field collections usually consist of approximately 75 per cent females."

"Little barley" may harbor Hessian fly.--Examination of grasses being tested as fly hosts by E. T. Jones, Wichita, Kans., reveals that "Hordeum pusillum Nutt., a native grass common to many wheat fields in this section, appears to be an important (potential) host of Phytophaga destructor Say. Thirty-three and six tenths per cent of the plants infested with eggs (artificially) produced puparia or grown larvae on this grass. The puparia were much smaller than those grown on wheat, but appeared to be normal in other respects."

COTTON INSECTS

Early oviposition of Pectinophora gossypiella Saund.--Reporting on the life history of the pink bollworm, W. L. Owen, jr., Presidio, Tex., says: "The first oviposition was recorded on April 21, when 13 eggs were recovered from a lantern globe cage which carried cotton seedlings. The eggs were fertile."

First eggs of Heliothis obsoleta Fab in East Central Texas.--E. W. Dunnam and R. K. Fletcher, College Station, Tex., report that "Although thousands of host plants were examined during the spring for eggs (of the cotton boll worm), none were found until April 8, when 5 eggs were recorded on 700 alfalfa plants."

Croton host of cotton fleahoppers.--Mr. Dunnam and R. W. Moreland report: "On April 27 heavy infestations of cotton flea hoppers were observed in a few cotton fields in which croton and other weeds were present. The croton was in the 2- and 4-leaf stage and the examination revealed from 1 to 4 hoppers on practically every plant in certain portions of these fields. Dock and cudweed were also infested. Moderate infestations of cotton growing in these fields were also observed. A few infestations of the small croton growing in the woods were recorded." At Tallulah, La., K. P. Ewing and R. L. McGarr found "On April 5, the first field nymphs of the season on young croton plants. The largest nymph observed was a fourth instar. The first P. seriatus adult of the season was found on April 18 on erigeron."

Record emergence of boll weevils at Tallulah.--G. A. Maloney reports that "Emergence to April 16 was 4.76 per cent, exceeding all records to this date and comparing with the next highest emergence of 3.71 per cent in 1927. * * * The first boll weevils in the field were reported by farmers from Rockwell County in the northern section during the week ending April 21."

INSECTS AFFECTING MAN AND ANIMALS

Pressure of fly spray affects toxicity.--Roy Melvin, engaged in fly spray research at Dallas and Menard, Tex., reports that "During April much time was allotted to the study of the effect of pressure

on the toxicity of pyrethrum (light oil) spray to house flies (Musca domestica L.) * * * In a typical test three groups of six cages each were treated at each pressure (25, 50, and 100 pounds) to study the reproducibility of results." His tabulated results show that "50 pounds pressure gives a greater per cent mortality than either 25 or 100 pounds. A study of all the results indicates that the maximum per cent mortality is obtained when 40 pounds pressure is used with this particular spray."

Blowfly parasites and predators active.---R. A. Roberts, Uvalde, Tex., reports that "Brachymeria fonscolombei Duf. has been very active during April, emergence has been completed from the overwintering material, a second generation has been secured from individuals which emerged in March, and there is abundant evidence of their activity in status jars exposed throughout the month. * * * Alysia ridibunda Say has completed its emergence from hibernation, and numerous fly larvae of several species and ages were exposed to the parasites, * * * Among the pupal parasites, there was an abundance of Mormoniella vitripennis Wlk. and some activity of Tricophria hirticollis Ashm., a species which with Xyalosema seems to be increasing from year to year in this area. Among the predators the greatest activity and abundance are among the various species of the genus Saprinus of the family Histeridae. As these beetles were active throughout the entire winter, they have bred up in large numbers and are very active around all carcasses."

Control of sand flies and mosquitoes through drainage systems.---"The handwriting on the wall seems to be that the control of sand flies can be interlinked with the control of salt-marsh mosquitoes through drainage systems," states W. E. Dove, Charleston, S. C., who with his assistants is experimenting with creosoted pine sap spray on marshes. "For strictly mosquito control it is necessary to provide for an annual maintenance of the ditches. A cleaning out of the ditches could be done effectively when the sand-fly larvae could be treated. An objection to this is the fact that the treatment of the ditches kills minnows. It is our observation that following the treatment the minnows are quickly replaced. Until they are replaced by migration, the sumpage keeps the mosquito larvae under control. It is only a question of a day or two before an abundant supply of minnows comes in again."

STORED PRODUCT INSECTS

Paradichlorobenzene effective against the webbing clothes moth.---Tests completed in April by Wallace Colman, Silver Spring, Md., "show that continuous fumigation with low concentrations of paradichlorobenzene vapor gives complete protection to clothing from injury by larvae of the clothes moth (Tineola biselliella Hummel). The success of such fumigation depends upon the fact that a chronic toxic effect, evidenced by a stoppage of all feeding, is produced by a concentration of the

vapor which is considerably below the minimum lethal concentration for a lengthy fumigation period. Larvae under the influence of the fumigant do not resume feeding for a considerable length of time after being removed to a normal atmosphere. In general, it may be said that the longer a larva is fumigated, the lower the concentration of vapor required to continue its quiescent state. Larvae may remain in this inactive condition for months and upon being removed from fumigation may complete development. The fact that the effect of the vapor is accumulative and that larvae recover from it very slowly gives additional margin of safety in its use."

Some seeds injured by paradichlorobenzene.---Reporting on the effect of fumigation with paradichlorobenzene on the viability of certain seeds, George W. Ellington, Sligo, Md., says: "Of the 35 varieties of seeds kept under constant fumigation for a period of 9 months, germination tests show that only 8 varieties were uninjured by this treatment, namely, Mammoth Yellow soy beans, Hubbard squash, Canadian field peas, cowpeas, garden peas, rape, white clover, and cotton seed."

Trap catches of fig insects reduced.---Perez Simmons, Fresno, Calif., reports that "Captures of insects in beetle traps in 4 fig plantings continued to be small (in April). The total number of Nitidulidae taken was 1,056, whereas in 1931 (March 31 to April 21) the same number of traps similarly located took 3,825, or 3.6 times as many."

Protecting figs against entry of insects.---Mr. Simmons states: "Laboratory trials of the efficacy of pumicite slurries for sealing green figs were made, using first-crop Calimyrna figs. This preliminary work suggests that a slurry composed of equal parts by weight of powdered pumicite and water will perhaps be the maximum dilution which may be expected to function as a spray for closing the apical opening of green figs."

Development of Ephestia figuliella in the field.---Mr. Simmons reports that at Fresno "The first pupae of the raisin moth were found under grapevine bark on April 4 and 5 and the first adults were taken in moth traps in 2 vineyards on April 19. (In 1931 the first pupae were found under bark on April 8. The months of March, 1931, and March, 1932, were each about 3.5° F. warmer than normal.) The appearance of the adults coincided well with the unfolding of the grape clusters."

First record of adult pea weevil in Oregon.---L. P. Rockwood, Forest Grove, Oreg., reports "taking a pea weevil in a pea field near this place on April 12. This is the earliest record of the weevil on peas this year."

Activity of pea weevils in Idaho.---Tom Brindley, of the Moscow, Idaho, sublaboratory, reports: "The first activity among the pea weevils this spring was observed on April 11, 1932. On this day several weevils were noticed flying about and others were found resting on the

sides of field cages. Claude Wakeland (collaborator) also reports catching a number of weevils in his migration traps. * * * Mr. Wakeland reports that the number of weevils that survived the past winter seems to be greater than the number that survived the winter of 1931. Hibernation studies showed that large numbers passed the winter successfully."

Bean fumigatoria in California prove efficient.--C. K. Fisher, of the bean weevil investigations, Modesto, Calif., reports: "The new fumigatorium constructed at Hughson Warehouse gave a kill of 98.91 per cent (of bean weevils). The fumigant used was chloropicrin and at the rate of 1 1/2 pounds per 1,000 cubic feet, with a 48-hour exposure. The temperature was not taken but thought to be about 65° F. maximum. * * * The tests of the Lyng fumigatorium have been completed and each test gave 100 per cent kill. These tests have shown that chloropicrin kills all stages of bean weevils at temperatures as low as 44° F."

Pupation and emergence of *Ephestia elutella* Hbn.--E. M. Livingstone, of the cured tobacco insect investigations, Richmond, Va. "continued during April the observations on individual rearings of *Ephestia elutella*," according to W. D. Reed. "The first pupation of overwintered larvae in the laboratory occurred on March 1 and the first emergence occurred April 21. On April 30, 59.2 per cent of these larvae had pupated and 1.2 per cent had emerged as adults. * * * The first moths of the spring brood were collected in infested tobacco warehouses in Richmond during the period April 18 to 24, while the first moth emerged from overwintered rearings in the laboratory on April 21. * * * Weekly records were made of the 35 light traps in the infested warehouses in Richmond. Three moths were captured during the week of April 18 to 24, which marks the beginning of emergence of the spring brood of moths."

Winter survival of *Lasioderma serricorne* Fab.--"On April 19" W. D. Reed and A. W. Morrill, jr., "made examination of three samples of tobacco taken from a hogshead in an unheated warehouse in Greenville, N. C., in order to observe the stages of the cigarette beetle that had survived the winter. A summary of these examinations is as follows: Larvae living, 53; larvae dead, 55; adults living, 0; adults dead, 14. These data agree with other records, indicating that this insect passes the winter as larvae in unheated warehouses."

TOXICOLOGY AND PHYSIOLOGY OF INSECTS

Grasshopper eggs develop after 18 months in cold storage.--J. W. Bulger, Takoma Park, Md., reports: "On March 11, 1932, grasshopper eggs, probably *Melanoplus differentialis* Thos., procured by F. L. Campbell in November, 1930, and kept since that time in moist sand at a temperature of 40° to 45° F., were taken from the refrigerator and placed in an incubator at about 76° F. On April 6 these eggs began to hatch. Judging from the number of nymphs emerging, the eggs apparently hatched normally and the nymphs are at present developing normally. As these eggs had been in

cold storage for about 18 months and had been kept dormant and viable under these conditions throughout one complete season, it was thought that this note might be of some interest."

Wise cockroaches spurn poisoned food.--Reporting on studies on the toxicity of a series of homologs of Paris green, M. C. Swingle, Takoma Park, says: "A series of experiments have been tried with the American roach but with little practical result. * * * It is hard to kill roaches (by poisoning) in less than two weeks, as they refuse to eat poisoned food. At the end of that time it is a question of starvation or poisoning, with little possibility of determining which. Various schemes have been tried to feed roaches sufficient poison to produce mortality in a reasonable length of time but these have not been successful. It is a rather singular fact that roaches would probably starve before eating poisoned food, but will eat unbelievable quantities of poison if it is placed on their feet or antennae. The tendency to clean these appendages is apparently greater than their native judgment. This method has been tried with these insects but it is very hard to feed quantitative amounts of the poisons (in this way)."

BEE CULTURE

Efficiency of insect pollenizers compared.--"Especially noticeable" reports E. L. Sechrist, Davis, Calif., "was the large number of ants feeding on nectar and pollen. They were on petals, leaves, buds, and everywhere about the trees, continually. Thrips were conspicuously absent this year. One of the outstanding things was the presence of large numbers of blowflies. This is not unusual but was unusually striking. Some of the counts indicate that there were literally thousands of these visiting blossoms and other parts of trees in any area. Honeybees were by all odds the most efficient pollenizers under observation, their activity being perfect for this important function. In watching individual bees, this pollenizing activity was clearly brought out, as many as 50 blossoms (pear) being visited systematically by an individual bee going from one tree to another. One bee working on dandelion was observed laboriously collecting pollen from blossom after blossom for a period of one hour. An important thing in contrast between the activity of bees and blowflies is that bees confine their visits to the blossoms. Nothing could be more systematic than the honeybee in these activities. Blowflies were next in abundance to honeybees, particularly in the Caldwell pear orchards. The activity of these insects appears to be perfectly aimless. They nervously flit about, touching trunk, branch, twig, leaf, or blossom, whichever is in front of them. They drift back and forth, at times lazily resting in the sun for many minutes.

FRUIT AND SHADE TREE INSECTS

Fruit flies regurgitate food.---James Zetek, Panama Canal Zone, engaged in experiments in control of the fruit flies Anastrepha fraterculus Wied., A. striata Schiner, and A. serpentina Wied. with various poisoned baits, says: "It was noted that in every case, and in all of the three species, the flies fill up on the sweet bait and then start to regurgitate it in form of droplets, walking as they do this, sometimes in spirals, so that the tiny drops resemble egg spirals of Aleurocanthus woglumi Ashm. Then the flies start to drink these droplets and all of them quickly disappear. Sometimes two or three individuals start to fight over these droplets. This regurgitation is not confined to poisoned baits. The flies regurgitate also when fed on water and molasses or sirup. They do it when feeding on a slice of orange. Some authors have maintained that regurgitation is due to too much arsenical in the bait, but in so far as our species are concerned, this is not so."

Longevity of parasites of the Mediterranean fruit fly.---A. C. Mason, Honolulu, T. H., reports as follows on his investigations of the parasites of Ceratitis capitata Wied.: "Parasite feeding and holding tests have been continued, with the view of determining the best methods of handling during prolonged periods. Opius humilis Silv. shows a remarkable longevity when given food and water and held at room temperature. Specimens are alive after 85 days, when fed on honey and cube sugar and kept in glass tubes or in a wooden cage. Honey agar maintained them for 65 days and is a satisfactory food when supplemented with water. Similar tests with Diachasma tryoni showed a longevity of 50 days on honey agar, 45 days on cube sugar, and 39 days on fresh honey and water. When kept in glass tubes in the cold room (44° to 50° F.) the parasites have also shown the ability to withstand long periods. No feeding and little activity take place here. One Opius withstood 38 days' continuous holding without food, and died on the 39th day. When removed to room temperature and fed for 24 hours at the end of each holding period of 6 to 10 days, the parasites have lived in the cold room for 66 to 72 days, with a mortality of less than 50 per cent. When the holding periods are in excess of 10 days mortality is greater, reaching 50 per cent at about 14 or 15 days continuous holding. Diachasma tryoni shows a higher mortality under similar tests, but small percentages have survived 60 to 72 days, when removed and fed at intervals of 6 to 10 days; 50 per cent mortality is reached after about 30 days. Continuous holding in the cold room showed a final survival of 22 days and 50 per cent mortality after about 14 days".

Carbon disulphide emulsion toxic to larvae of pecan weevil in soil.---T. L. Bissell, Experiment, Ga., reports that "Fully developed larvae of the pecan weevil (Curculio caryae Horn) were dug from soil beneath

pecan trees during January and February and allowed to reenter soil on marked plots. Plots were laid in two localities on two soil types. * * * 25 larvae were placed on each plot on January 23 and March 4. Carbon disulphide was applied April 6 and 7, * * * Concentrations of CS₂ ranged from 20 to 150 parts to 100,000 of water. Fifteen dosages, varying in amount of water and concentration of insecticides, were tested, with three or four separate plots to the dosage. The soil temperature at 6 inches' depth ranged from 66° to 76° F. during the period of application. * * * The results show a fairly uniform increase in killing of pecan weevil larvae, from 42 per cent at a concentration of 20 to 100 per cent at a concentration of 100 and above."

Liquid lime-sulphur only partially effective against San Jose scale in Georgia.--Oliver I. Snapp and J. R. Thomson, Fort Valley, Ga., report that "In order to obtain as much data as possible on the results from liquid lime-sulphur when used against the San Jose scale (*Aspidiotus perniciosus* Comst.) in central Georgia during the winter of 1931-32 and spring of 1932, an additional experiment was started on March 24 in which one-half of each tree was wrapped with burlap to serve as a check and the other half was sprayed with 32° Baumé freshly made liquid lime-sulphur at the rate of 1 part of the concentrate to 7 parts of water. The experiment was duplicated in two orchards. Scale counts were made just before the spray was applied on March 24 and again on April 25 to determine the results." The results from this experiment show that the percentage of control ranged from 28.7 to 35.5 per cent--"a little better than reported from previous experiments during the winter, but it is still very low as compared with the results from oil emulsion."

Pear leaf blisters caused by external feeding of mites.--E. J. Newcomer and A. R. Rolfs, Yakima, Wash., "have been making careful observations this spring on the habits of the pear-leaf blister mite," to determine the cause of the blisters. Mr. Newcomer says: "We find that the overwintering adult mites begin to deposit eggs late in March in the buds, when the latter have just begun to swell. Within two weeks most of the adults have disappeared and the eggs are beginning to hatch. The young feed within the expanding buds and at the base of the leaf petioles. The first blisters were found about 10 days after the first eggs hatched, at which time many of the leaves were partially expanded. The blisters seem to result from the external feeding of the mites, and many of them, especially on the fruit stems and petals, do not contain any mites. On the leaves, the mites, now full grown, bore into the blisters, making the characteristic small holes that are usually found, feed within, and soon begin depositing eggs within the blisters. Many of the mites remain outside, and the adults have been observed entering and leaving the blisters. The first eggs, laid by overwintering mites, were found March 21 and by April 19 eggs of the next generation, laid in the blisters, were beginning to hatch."

Red scale survives equally well on lemon and orange.--C. I. Bliss and assistants, Whittier, Calif., report that "Comparison of survival of the

red scale (Chrysomphalus aurantii Mask.) on lemon and Valencia orange fruits from adjacent trees in the same grove showed approximately the same resistance regardless of host. * * * Inasmuch as it has generally been found that orange trees can be kept clean of red scale by the use of lower dosages than are effective on lemon trees, the difference in field results probably indicates a difference in the uniformity of stage of development or rapidity of reproduction between the two hosts."

JAPANESE BEETLE AND ASIATIC BEETLE RESEARCH

Treatment of potted plants to kill Japanese beetle.--J. W. Lipp, engaged in control investigations of the Japanese beetle at Moorestown, N. J., reports: "Results with paradichlorobenzene indicate that a satisfactory larval kill can be obtained by mixing the chemical with soil and using the mixture to cover infested pots plunged in clean soil. Naphthalene, when applied under the same conditions, is not so effective as paradichlorobenzene. In the tests previously indicated, the soil had a tendency to dry out on top. Subsequent tests were run in which the soil was wet thoroughly after treating and was kept rather moist throughout the duration of the treatments. In these tests it was evident that this addition of moisture prolonged slightly the length of time necessary to kill with paradichlorobenzene, while with naphthalene no appreciable difference was noticed, all the results being unsatisfactory. From all tests it is evident that in a heavy meadow soil larvae require a heavier dose of paradichlorobenzene (or a longer period of exposure) than that necessary to kill in the clay soils."

Two species of Ithonidae useless against Scarabaeidae.--Reporting on research work with parasites of scarabaeid beetles at Homebush, Australia, R. W. Burrell says, "it was found out that the Australian moth-lacewing (Ithone fusca Newm.) is entirely coastal in distribution, and confined to the sandy country. The species occurring at Eastwood and Epping, where the soil is heavier, is Heterithone megacerca Tillyard. Fortunately, I had marked the place of origin of all specimens in record series, and sufficient work has been done with individuals from both localities so that it is considered that both have had a fair trial and are useless against Scarabaeidae."

TRUCK CROP AND GARDEN INSECTS

Iris thrips overwinters on its host plant.--Floyd F. Smith, of the tropical greenhouse, Washington, D. C., reports: "In connection with the trip to western New York (in April), I found the wingless Bregmotothrips iridis Watson overwintering as adult females on the living shoots of Japanese iris at a farm at Hamburg, N. Y. This thrips was found on the same plants and on Kniphofia last October."

Gladiolus insects controlled by phenol dips.--H. H. Richardson, of the tropical greenhouse, reports that "Final observations were taken on the insecticidal action of phenol dips of various concentrations (immersion of 3 hours at 70° F.). The results corroborated those reported last month--that is, phenol dips of 1-to-80 and 1-to-120 concentrations (U. S. P. X.; 88 per cent phenol) gave complete control of all stages, including the eggs. A 1-to-160 concentration was ineffective. It was interesting to note that the mite Tyroglyphus lintneri Osborn was effectively controlled by phenol dips."

Ethylene oxide may injure gladiolus corms.--Mr Richardson states that "The insecticidal action and also the plant tolerance of ethylene oxide was studied in a few small-scale experiments. Concentrations of 1, 2, and 4 pounds per 1,000 cubic feet of space were tried for 24-hour exposures at 70° F. Only the 2-pound concentration of ethylene oxide was tried for insecticidal tests because of the limited supply of infested corms. Complete kill of all stages of the thrips was obtained at this concentration. However, all these concentrations produced severe injury to the corms and have evidently killed them. Especially is this true of dosages at 2 pounds per 1,000 or above. Such treated corms are soft and punky and secondary fungal growths are starting to form on them. The injury produced by ethylene oxide was more evident on clean, fresh corms (just out of storage and having a fairly high moisture content) than on corms the surfaces of which had been almost completely eaten over by thrips and which had lost considerable moisture in dry, warm rooms."

Twenty-eight pound dose of ethylene dichloride-carbon tetrachloride maximum for gladiolus corms.--Mr. Richardson reports that in order to reply to inquiries as to injury to gladiolus corms by fumigation with ethylene dichloride-carbon tetrachloride, repeated tests have been made and that "It appears from these studies that dosages of over 28 pounds per 1,000 cubic feet (exposure 24 hours at 70° F.) should not be used for the fumigation of gladiolus corms, else injury is liable to occur."

Pyrethrum-soap not toxic to thrips.--Mr. Richardson reports experiments with pyrethrum-soap mixture on the gladiolus thrips (Taeniothrips gladioli M. & S.) He says: "Peeled gladiolus corms and cormels were dipped for 3 minutes in a freshly prepared mixture of pyrethrum (1 to 5,000) with soap (1 to 400). In one series of tests these were allowed to dry over night; in another series for 1 hour. Then various stages of the gladiolus thrips (adults, pupae, and larvae) were placed on the isolated treated corms and cormels, and observations made over a series of days. After being placed on the corms, the thrips appeared to be slightly irritated for a few minutes, but this stimulation soon disappeared and the thrips fed and grew normally to maturity. The adults laid fertile eggs which in turn hatched into normal individuals. It appears from this series of tests that even strong pyrethrum-soap mixtures leave no residues that are toxic to thrips of this species, and that their insecticidal action is, in the main, largely limited to a contact action."

Peculiar habits of earwigs.--S. E. Crumb, engaged in a seasonal-history study of the European earwig (Forficula auricularia L.) says: "Ordinarily females either do not deposit or they eat the eggs in confinement. Attempts to hatch the eggs in the absence of the female have been unsuccessful. In nature the female frequently turns and licks the eggs and this procedure seems to be essential to hatching. The process of hatching has been observed. Apparently the female does not assist in this, although the young sometimes experience considerable difficulty in freeing themselves from the egg membrane. Young earwigs are seen sometimes mouth-to-mouth with the parent as though they might be receiving food by regurgitation, but they may have been merely following their habit of licking which is carried out on the adult or upon any dead insect which may be placed with them. The young are able to feed on tender plant and animal tissue soon after emergence."

Weather at hatching time chief factor in pea aphid mortality.--John E. Dudley, jr., Madison, Wis., reports that "Hatching of pea aphid eggs in hibernation experiments is completed. Forty-two hundred eggs were divided into five unequal parts and placed under heavy, medium, and light coverings of hay; some under a cover a foot above them to protect only from sun, rain, and snow; and some were left entirely exposed to the elements. Of those protected from sun, rain, and snow, 11 per cent hatched; of those entirely exposed, 50 per cent hatched; of those under light cover, 25 per cent hatched; of those under medium cover, 31 per cent; and of those under heavy cover, 25 per cent hatched. From these and previous results it is quite evident that * * * the weather conditions around hatching time are very important * * * It is apparent that owing to the periods of warm weather in early April, the eggs exposed to the sun hatched early and in large numbers. As a contrast, those protected entirely from the sun's rays were very slow and late in hatching, and many completely mature embryos died before emerging from the shell. The eggs uncovered but protected above from snow, rain, and sun were subjected to such severe changes in temperature in March and April that the mortality was highest of all. * * * a warm period of several days' duration in late March very likely brought the eggs close to hatching. There immediately followed a precipitous drop to subzero temperatures, accompanied by snow, and the eggs were forced to withstand the full effect of this extreme change. It is believed that this is the principal reason for the low percentage of hatch."

Food requirements of wireworms.--C. E. Woodworth, Walla Walla, Wash., reports: "In an experiment to determine the food requirements of (wireworm) larvae, involving 3,000 one-day-old larvae, it has been observed that after one and one-half months 1 grain of wheat was not quite enough and 2 or more grains was more than enough for the period. The 1-grain group was slightly smaller on the average than the groups receiving 2 or more grains. There was no noticeable difference in the groups receiving 2, 3, 4, and 5 grains."

Trapping for Pheletes canus Lec.--R. S. Lehman, Walla Walla, reports that "An interesting experiment was tried this year in which female wireworm beetles were placed in the trap to attract males. One trap containing females captured 719 males in one day. An observation made in the field showed that the males were attracted for at least 50 feet by the females. It is also interesting to note that female Pheletes californicus Mann. are just as attractive to male Pheletes canus Lec. as are females of their own species."

Relative abundance of wireworm species.--E. W. Jones, Walla Walla, reports: "Effort has been made to find the relative abundance of Pheletes canus Lec. and P. californicus Mann. in the cultivated land of Walla Walla Valley. Population statistics based on some 2,500 samples and collected during 1931 have been summarized for this report." A table (submitted) shows that "The average population in the Walla Walla Valley for P. canus Lec. fields is 9.5 per sq. ft. and for P. californicus Mann. fields, 8.6 per sq. ft. A study of the table indicates that there are evidently specific limitations in the local distribution of the forms. P. canus, for example, is least abundant in fields that are not in truck crops. On the other hand, P. californicus shows a preference for field crops and is least abundant in truck crop gardens."

Tobacco stalk borers long lived.--Longevity records made by K. B. McKinney, Tempe, Ariz., "from a general assortment of 232 bred and collected adult stalk borers (Trichobaris mucorea Lec.)" show that 90.5 per cent lived longer than 10 days; 56.5 per cent longer than 20 days; 6 per cent longer than 101 days; 3.9 per cent longer than 130 days; and 1.7 per cent longer than 201 days. "One individual that emerged on August 1, 1931, lived 271 days."

Lesser bulb fly.--F. J. Spruijt, Babylon, N. Y., reporting on bulb insect investigations, says that the totals of this year's (1932) Eumerus samples taken are: In greenhouses, 123 males, 106 females; in dump heap, 58 males, 7 females; or a grand total of 181 males and 113 females. "Thus far only one species of Eumerus has been taken, namely, E. tuberculatus Rond."

Vapor heat treatments not injurious.--Reporting on vapor heat treatments of narcissus bulbs, Mr. Spruijt says: "No injury (to foliage or flowers) due to treatment could be detected. Flower records were begun in the second half of the month; the flowering was at its prime during the last week of the month."

Effects of vapor treatment on the flowering of out-door narcissus.--Continuing studies on the effect of vapor heat treatments of narcissus bulbs, Randall Latta, Sumner, Wash., reports that in the continuous treatment series King Alfred bulbs "treated for the second consecutive year showed no detrimental effects in the flowering * * * Treatments from September 8 on showed an increasing amount of blinds." Glo-

ry of Sassenheim, treated similarly, "showed no detrimental effects in the flowering, but one sample from a commercial lot showed a very low percentage of bloom." In the time series, in which a constant temperature of 111° F. was maintained and the bulbs exposed for periods of 4, 6, 8, 10, and 12 hours, on August 24, 1931, Victoria bulbs "showed about the same grade of flower throughout. Bulbs receiving longer treatments bloomed a little earlier." In the temperature series, in which bulbs were treated for 4 hours at varying temperatures--110°, 111°, 112°, 113°, 114°, and 115° F.--on August 29 and 30, 1931, the results of Victoria bulbs were "a slightly shorter growth in bulbs treated at 113° and above, also a slightly lower grade of flowers in bulbs treated at higher temperatures. Otherwise the series was about normal." Bulbs of the Emperor variety "showed effects paralleling those in Victoria," while "two samples from commercial loads (treated for 4 hours at 111° F.) showed complete reversal of each other. One sample was more vigorous than the untreated and produced grade 2 flowers. The other treated sample was much weaker than its check, many bulbs not producing a flower. The reason is not evident for this." In the weekly fumigation series varieties treated with the standard dosage (7 ounces sodium cyanide per 1,000 cubic feet for 4 hours) and showing no injury were: Victoria, Emperor, King Alfred, and Laurens Koster.

